STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MECH 242 – Fluid Power Lab

Created by: Daniel Miller

Updated by:

Canino School of Engineering Technology

Department: Mechanical & Energy Technologies

Semester/Year: Fall 2018

A. **TITLE**: Fluid Power Lab

B. **COURSE NUMBER:** MECH 242

C. **CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)**

 # Credit Hours: 1
 # Lecture Hours: **per week**
 # Lab Hours: (1) two-hour lab **per week**
Other: **per week**

Course Length: **Weeks**

D. **WRITING INTENSIVE COURSE**: Yes ☐ No ☒

E. **GER CATEGORY: None:** ☒ **Yes:** GER
***If course satisfies more than one*:** GER

F. **SEMESTER(S) OFFERED: Fall** ☒ **Spring** ☐ **Fall & Spring** ☐

G. **COURSE DESCRIPTION:**

A study of force and motion in hydraulic and pneumatic cylinders, involving cylinders, pumps, valves, and accumulators. Electrical, hydraulic, and pneumatic controls will be studied, with an emphasis on sequential operation of fluid devices. Both electrical and fluid schematic diagrams will be examined.

H. **PRE-REQUISITES: None** ☒ **Yes** ☐ **If yes, list below:**

CO-REQUISITES: None ☐ **Yes** ☒ **If yes, list below:**

MECH 241

I. STUDENT LEARNING OUTCOMES: (*see key below*)

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
1. Draw and interpret schematic diagrams consistent with industrial practice related to fluid power systems			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
2. Apply Pascal and Bernoulli's laws to investigate the relationships within fluid systems			2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets
3. Determine horsepower and efficiency for fluid power systems.			2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets
4. Size pipes, pumps, motors, cylinders, and accumulators.			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
5. Size air compressors to handle the pneumatic systems requirement.			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
6. Interpret sequence diagrams that utilize relay and coil logic.			2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets

7. Work in teams to accurately collect data and report results in an industrial accepted format			1-Comm Skills ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets

KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit,/Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

*Include program objectives if applicable. Please consult with Program Coordinator

J. APPLIED LEARNING COMPONENT: Yes ☒ No ☐

If YES, select one or more of the following categories:

- ☒ Classroom/Lab
- ☐ Internship
- ☐ Clinical Placement
- ☐ Practicum
- ☐ Service Learning
- ☐ Community Service
- ☐ Civic Engagement
- ☐ Creative Works/Senior Project
- ☐ Research
- ☐ Entrepreneurship (program, class, project)

K. TEXTS:

Daines, James R., Fluid Power Hydraulics and Pneumatics, Goodheart-Wilcox Company, Inc., 2009

L. REFERENCES:

"Fluid Power with Applications" - 5th edition, by Anthony Esposito, Prentice Hall Inc., 2000
Industrial Hydraulics Manual, Vickers
Closed loop Electro hydraulic Systems Manual, Vickers

M. EQUIPMENT: None ☐ **Needed:** Fluid Laboratory equipment and Computer Drafting room

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Homework, Lab reports

P. DETAILED COURSE OUTLINE:

I. Pneumatic Circuits
- **A. Schematic Diagrams and Symbols**
  - **1. Read and draw schematics**
- **B. Automation Studio Software**
- **C. Sequencing Logic**
- **D. System Components**
- **E. Pressure Loss vs. Line Length Experiment**

II. Hydraulic Circuits
- **A. Schematic Diagrams and Symbols**
- **B. Automation Studio Software**
- **C. Sequencing Logic**
- **D. System Components**
- **E. Hydraulic Test Stand Experiment**

III. Electro-Pnuematic Circuits

A. Circuit Logic

B. PLC Integration and Linking Components in Software

Q. LABORATORY OUTLINE: None ☒ Yes ☐